

March 28th, 2019

P.N. 18-11393B

Innovative Planning Solutions

150 Dunlop Street East
Suite 201
Barrie, Ontario
L4M 1B1

**Reference: 910 Veterans Drive, City of Barrie
53 Unit Back to Back Townhouse Development
Functional Servicing & Storm Water Management Brief**

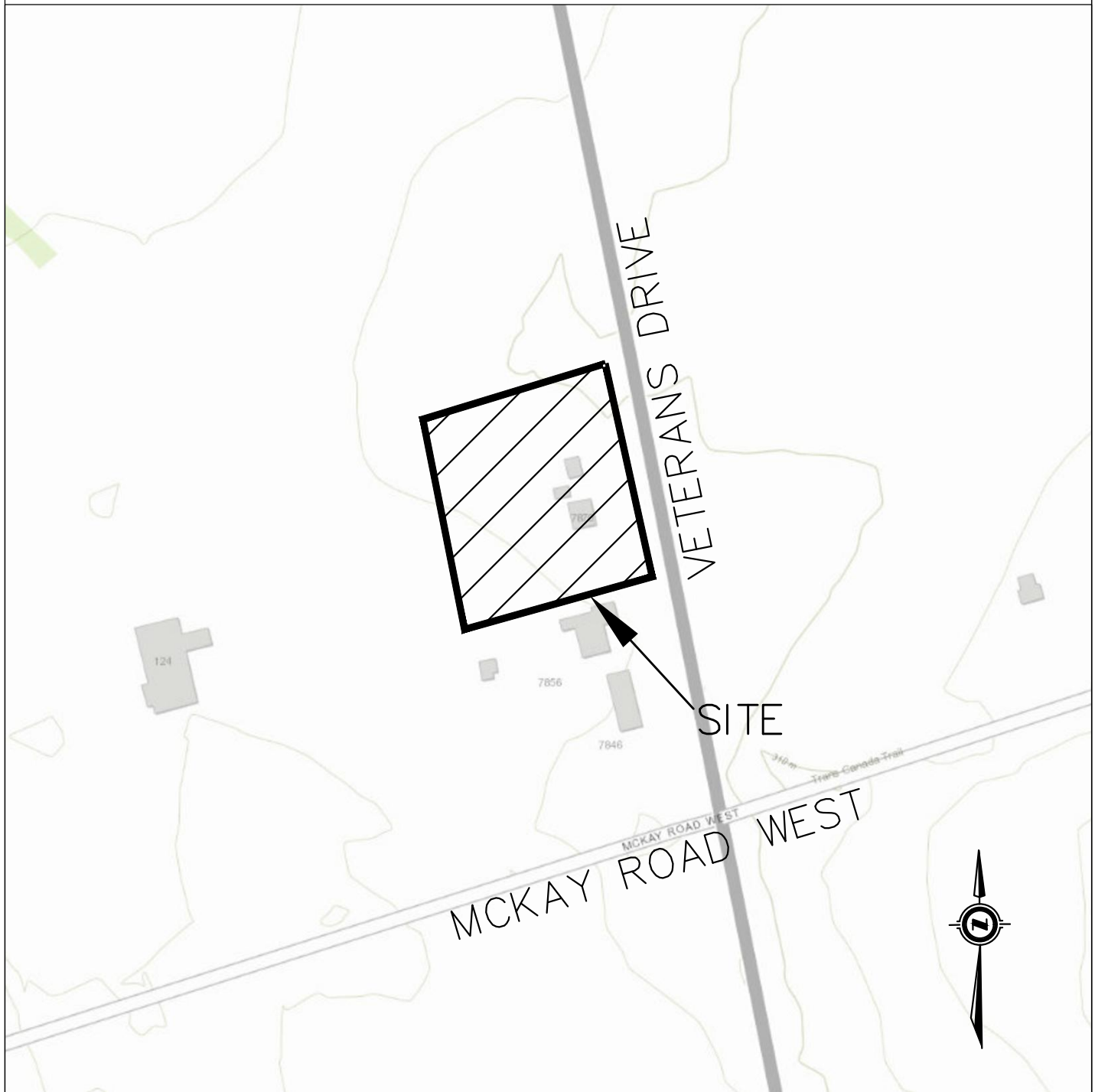
1.0 INTRODUCTION & BACKGROUND

The subject site is approximately 0.74 hectares in area and was incorporated into the City of Barrie boundary by the Barrie-Innisfil Boundary Adjustment Act, 2009. It is a part of the proposed Salem neighbourhood within the Annexed Lands and is currently occupied by a single residential home. Existing access to the property is provided from Veterans Drive. The site is currently bounded by existing agricultural land to the north and west, Veterans Drive to the east and existing residential to the south. The location of the subject site is further illustrated on Figure 1.

The proposed development concept includes 53 back to back townhouse / townhouse units. As part of the proposed secondary plan, medium and low-density residential development will be developed to the north and west of the site, and potentially high density residential to the south. Access to the proposed development will be provided via an 8m wide municipal lane connecting from Street 'E' to Lane 'T' constructed through the plan of subdivision by H&H Group Ltd.

The proposed development concept prepared by Innovative Planning Solutions is included as Figure 2 and further illustrates the development concept and future surrounding uses.

The purpose of this brief is to describe the existing servicing infrastructure in the vicinity of the site, and provide recommendations for the provision of sanitary drainage, water distribution and stormwater management in accordance with City of Barrie criteria in support of Draft Plan Approval.







2.0 SANITARY SERVICING

2.1 Existing Sanitary Servicing

No municipal sanitary servicing is readily available for connection. Upon review of the *Wastewater Collection Master Plan* by amec sewage flows from the site will be directed south through the proposed residential subdivision and towards the McKay Road trunk sewer. Sewer design grades within the proposed subdivision south and west of the subject are unknown at this time.

2.2 Proposed Sanitary Flows

Contributing sanitary flows from the proposed development were calculated using City of Barrie design criteria as follows:

- A residential average sewage flow of 225 litres/capita/day
- A residential population density of 2.34 persons/unit
- An extraneous flow rate of 0.1 litres/sec/ha
- A peaking factor based on Harmon's equation

With a total residential count of 124 persons and incorporating extraneous flows, the combined peak sewage flow generated by the proposed development is calculated to be approximately 1.4 L/sec. Detailed sanitary calculations are appended.

2.3 Proposed Sanitary Servicing

Based on our review of servicing strategy for the adjacent subdivision (H&H Capital Group Ltd.), gravity sanitary servicing will be constructed along Street 'E'. Assuming a connection invert of approximately 3m lower than the proposed road grade, it is anticipated that gravity servicing can be achieved for the proposed site with sanitary flows being conveyed to the south and towards the Street 'E' sanitary sewer. It is understood that the town home units will not have basements which may allow for shallower sanitary depths within the laneway. Sanitary pumping of basement sewage may be required if basements are constructed.

The subject development will be serviced from the extension of a gravity main from Street 'E'. Each unit will be serviced with individual gravity sanitary services from the municipal laneway. Servicing details will conform to City of Barrie standards and the exact size and location of the service lateral will be determined during detailed design to the support the Site Plan Application.

Cost sharing may be required to utilize the sanitary sewer located on Street 'E' within the H&H Capital Group Ltd. subdivision. Coordination with the adjacent land owner will be required to ensure compatibility between sanitary inverts at the detailed design stage.

A conceptual servicing layout is provided in Appendix B.



3.0 WATER SERVICING

3.1 Existing Water Servicing

No municipal water servicing is readily available for connection. Upon review of the *Water Storage and Distribution Master Plan* by amec a 500mm diameter watermain is planned to be constructed adjacent to the subject site along Veteran's Drive from Salem Road to McKay Road West.

3.2 Proposed Water Demands

The domestic water demands for the proposed development are listed in Table 1 below:

Table 1: Domestic Water Demand

Population	Per Capita Flow (L/day)	Peaking Factors (based on MOECC Guidelines)		Flows (L/sec)	
		Peak Hour	Maximum Day	Peak Hour	Maximum Day
124	225	2.25	1.5	0.79	0.52

Fire demands for the proposed development will be calculated in accordance with the Fire Underwriters Survey (FUS) at the detailed design stage. Based on our experience with similar back to back developments, fire flows typically range in the 100-120 l/sec range. This is dependent on construction type and if sprinklers will be installed.

3.3 Proposed Water Servicing

Based on our review of servicing strategy for the adjacent subdivision (H&H Capital Group Ltd.), water servicing will be constructed along Street 'E' and along Lane 'T'. It is anticipated that the final watermain configuration will consist of a looped connection from Street 'E' to Lane 'T' through the proposed development. Based on the proposed watermain sizes, it is expected that sufficient water supply will be available to service the proposed development.

Each unit will be serviced with individual water services from the municipal laneway. Servicing details will conform to City of Barrie standards and the exact size and location of the service lateral will be determined during detailed design to support the Site Plan Application.

Cost sharing may be required to utilize the watermain located on Street 'E' within the H&H Capital Group Ltd. subdivision. Coordination with the adjacent land owner will be required to ensure compatibility between watermain inverts at the detailed design stage.

A conceptual servicing layout is provided in Appendix B.



4.0 STORM DRAINAGE

4.1 Existing Storm Drainage

Currently no storm infrastructure exists on the property or along Veterans Drive. Topography through the site is generally flat and site drainage is conveyed to the north and south in the form of overland sheet flow to adjacent properties with no quality or quantity control.

4.2 NVCA & LSRCA Drainage Boundary Adjustment

A slight modification of the watershed boundaries between the two respective CA's is required to direct post development flows from the subject site to proposed SWMF E2. The adjustment to the boundary required for 910 Veterans Drive requires approximately 0.6ha of land to be directed to the NVCA watershed.

4.3 Storm Water Management

Based on our review of the overall grading concept for the proposed H&H Capital Group Ltd. subdivision, storm drainage from Street 'E' will be directed to the proposed SWMF E2 constructed at the southwest limit of the H&H Capital Group Ltd. property. It is understood that the SWMF can be sized appropriately to provide quantity and quality control of storm water per the approved SIS report for the subject site. The owner of the subject property will be required to cost share with the land owners group to ensure the SWM facility is sized to accommodate post development runoff from the subject site.

The use of Low Impact Development (LID) measures such as permeable pavers and infiltration will be examined at the detailed design stage. LID measures could also potentially be incorporated into the municipal laneway if acceptable by the City.

Phosphorus and water balance calculations will be provided at the detailed design stage once the design details for downstream SWMF E2 are understood. It is anticipated that the downstream pond will provide some aspect of phosphorus removal and water balance benefits.

5.0 GRADING & ROAD STANDARD

The grading concept for the development lands will require extensive fill based on the surrounding concept grades provided in the FSR prepared for the H&H Capital Group Ltd. development. It is anticipated that these concept grades will be refined as detailed design of the subdivision moves forward. Grading on the subject lands is dependent on the final grades determined along the north and west boundaries. In general, the proposed laneway will slope moderately from the north to the south towards Street 'E'.

Coordination will be required to ensure the grades at the connection point with Lane 'T' match. Based on the concept grading plan prepared for the H&H Capital Group Ltd. development, this area may require slight adjustment to create a highpoint and drainage divide at the lot line. This will be further examined



at the detailed design stage once the subdivision grading has been examined. Retaining structures will likely be required along the east limit adjacent to Veterans Drive. It is also recommended that the City review the proposed Veterans Drive grading design. Based on the proposed grading design developed by H&H Capital Group Ltd., the proposed subdivision at Street 'E' will be approximately 4m above Veterans Drive. The design of the proposed townhouse units should include a walk-out style grading design along Veterans Drive to reduce grade change between the proposed development and Veterans Drive right of way.

Currently the subject site is accessed via an asphalt driveway from Veterans Drive. Veterans Drive is currently a 2-lane rural road cross-section. A Municipal Class EA Schedule C was prepared by Stantec Consulting Ltd. to provide alternatives to address transportation improvements in the Salem Secondary Plan area. The preferred alternative provided in the EA proposed to expand Veterans Drive to a 34m right of way along from Salem to McKay and along the frontage of the subject site. Existing and proposed road elevations are further illustrated on an excerpt from the EA included in Appendix A.

The draft plan proposes an 8.0m road allowance per City of Barrie road allowance standard BSD-313. A preliminary grading design for the proposed street is provided on the attached engineering plans. The final grading design is contingent on the grading design developed for the H&H Capital Group Ltd. subdivision. A copy of the road standard is included in Appendix A and it is noted that this standard currently doesn't include water and sanitary servicing. A new 8.0m road allowance standard incorporating full servicing will need to be developed.

7.0 UTILITIES

The Salem Secondary Plan (OPA No. 38) indicates the following with reference to utility design:

- a) Prior to approval of development within the Salem Secondary Plan Area, all interested telecommunications providers and required utilities providers shall work with the landowner(s) and the City to confirm their plans for services to support the proposed development. The City shall work with the providers to determine appropriate locations for large equipment or cluster sites.
- b) All telecommunications services and utilities should be located within an initial common trench, whenever possible, to avoid unnecessary digging and disruption on municipal rights of way.
- c) Consideration shall be given to the location of telecommunication facilities and utilities within public rights of way as well as on private property. Utilities and telecommunications facilities shall be grouped/clustered or combined where possible and feasible to maximize the use of land and, where applicable, to minimize visual impact. Utilities and telecommunications facilities shall be placed in such a manner so as to not visually detract from the streetscape. The City shall encourage utility and telecommunications providers to consider innovative methods to make these facilities less noticeable including containing such services on or within streetscape features such as gateways, light standards, bulk water meters and transit shelters where it is feasible.

Hydro, gas and cable are proposed to be available to service the subject site. Coordination with local utilities companies will be required to obtain utility servicing drawings at the detailed design stage.



8.0 CONCLUSION

Based on the above findings, it is anticipated that the proposed development will be serviced from future servicing to be constructed along Street 'E'. Storm water from the site will be directed to Street 'E' and discharge to the proposed SWMF E2 located within the H&H Capital Group Ltd. Lands. Grading on the subject site is largely impacted by the final grading determined through the detailed design of the subdivision along the north and west boundaries. Grading will need to be coordinated at the detailed design stage to ensure compatibility. The developer will be responsible to ensure necessary cost sharing arrangements are in place to utilize the servicing on Street 'E'.

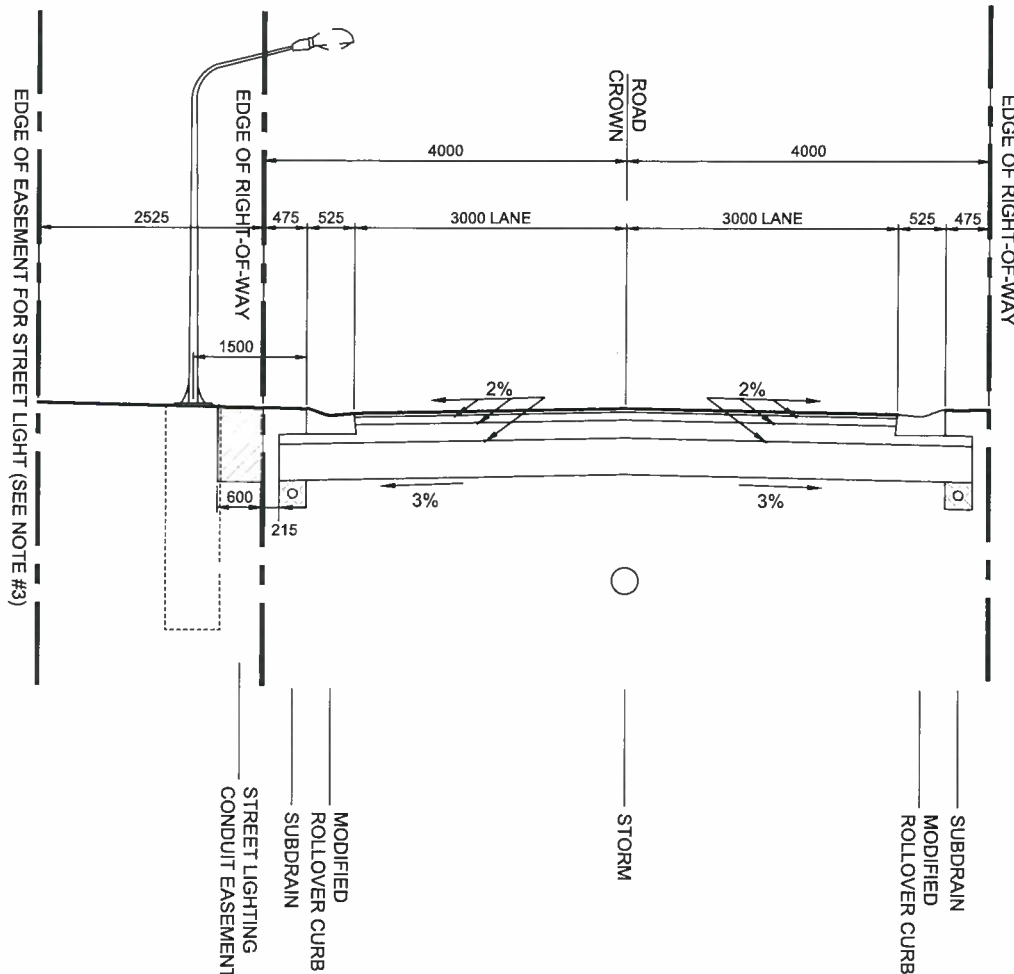
We trust this is satisfactory and should you have any questions, please call.

All of which is respectfully submitted by:

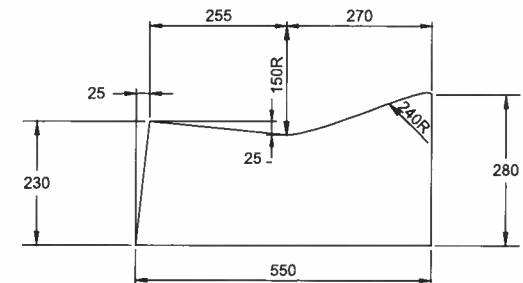
Joe Voisin, P.Eng., C.E.T.
Senior Engineer, Partner

APPENDIX A

Preliminary Design Calculations and Background Information



MODIFIED ROLLOVER CURB DETAIL



MODIFIED ROLLOVER CURB NOTES:

1. TOP EDGES OF CURB AND GUTTER TO BE ROUNDED USING AN APPROVED EDGING TOOL.
2. ALL CONCRETE WORK TO CONFORM TO ONTARIO PROVINCIAL SPECIFICATIONS & STANDARDS (OPSS).
3. CLASS OF CONCRETE: 30MPa
4. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
5. ALL DRIVEWAY & SIDEWALK RAMPS TO BE DESIGNED AND CONSTRUCTED TO APPLICABLE ONTARIO PROVINCIAL STANDARDS AND CITY OF BARRIE STANDARDS.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. STORMWATER SYSTEMS TO BE DESIGNED IN ACCORDANCE WITH CITY OF BARRIE ENGINEERING GUIDELINES AND STANDARDS.
3. STREET LIGHTING IS TO BE PLACED IN A 2.4m WIDE BY 2.525m DEEP EASEMENT FROM THE EDGE OF RIGHT-OF-WAY (3.0m DEEP FROM THE OUTSIDE EDGE OF CURB). CONDUIT AND POWER FEEDS ARE TO BE PLACED IN A 0.6m LINEAR EASEMENT ALONG THE OUTSIDE EDGE OF THE RIGHT-OF-WAY. REFER TO THE CITY OF BARRIE ROADWAY ILLUMINATION POLICIES AND DESIGN GUIDELINES AND ASSOCIATED BSD'S FOR LIGHT STANDARD AND POLE BASE LOCATION AND DEPTH.
4. REFER TO TRANSPORTATION DESIGN MANUAL FOR PAVEMENT DESIGN METHODOLOGY.
5. TREE/LANDSCAPING ARE TO BE ACCOMMODATED WHEREVER POSSIBLE IN LOCATIONS APPROVED BY THE PARKS, PLANNING, AND DEVELOPMENT BRANCH AND IN ACCORDANCE WITH CITY OF BARRIE GUIDELINES.
6. STRAIGHT RUNS PREFERRED.
7. UTILITIES AND SITE SERVICING ARE TO BE PROVIDED FROM FRONT FACING STREET (WHEREVER POSSIBLE).

Barrie
STANDARD DETAIL

8.0 m LANEWAY
ROAD ALLOWANCE
6.0 m ASPHALT

REV No.

1

DATE: OCT 2017

SCALE: N.T.S.

BSD-313

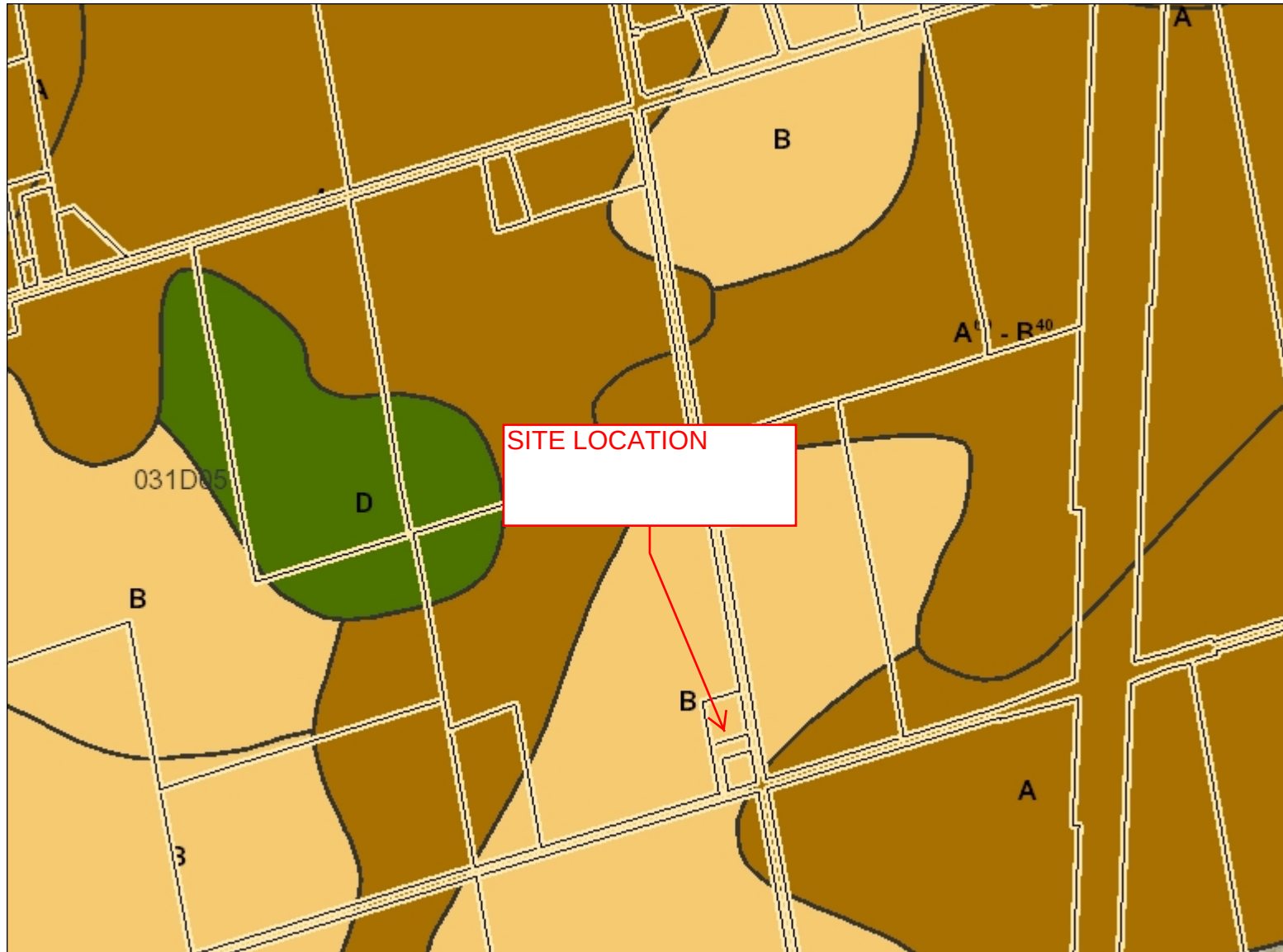
APPROVED

DATE . . . Oct 28/17 . . .

... R. Sutter ...
DIRECTOR OF ENGINEERING

910 Veterans Drive				SANITARY SEWER DESIGN SHEET				Design Parameters																										
City of Barrie								Average Daily Flow Residential0.0026 L/s/c Commercial0.326 L/s/ha Mannings "n" Min. Velocity Max. Velocity Residential Harmon Peaking Factor (F) Infiltration 0.0130 0.75 m/sec 3.0 m/sec 0.10 L/s/ha																										
Project Number: 17-11313B Date: March 1, 2019 Design By: LPB Checked By: JHV File: \\pinestoneserver\company\Project Documents\11393B 910 Veterans Drive FSR\FSR\FSR\Sanitary Sewer Design Sheet.xls				Drainage Area Plan No: N/A																														
LOCATION				RESIDENTIAL AREAS and POPULATION					SCHOOL, INSTITUTIONAL			COMMERCIAL			INDUSTRIAL				INFILTRATION			DESIGN												
STREET		AREA NO.		MANHOLE LOCATION FROM MH TO MH		AREA UNITS		POPUL. CUMUL POPUL.		PEAK FACTOR "F"		PEAK RES. FLOW		HECTARES AND FLOW OF EACH ZONING						TOTALS C-I FLOW	AREA CUMUL AREA		INFIL FLOW		TOTAL VOLUME FLOW LENGTH SLOPE PIPE SIZE CAPACITY FULL FLOW VELOCITY ACTUAL VELOCITY									
														0.00 L/s/ha			0.326 L/s/ha															0.00 L/s/ha		
														AREA CUMUL AREA PEAK FLOW			AREA CUMUL AREA PEAK FLOW															AREA CUMUL AREA PEAK FLOW		
						ha		1000s 1000s		L/sec		ha ha L/sec			ha ha L/sec			ha ha L/sec			L/sec		ha ha L/sec											
Proposed Development (53 Townhouse Units)										0.74 53.00		0.124 0.124 4 1.2919													0.74 0.74 0.0740		1.3659							

Soils Map



Legend

Parcels

- Assessment Parcel
- Farm Tax Rated Parcels - Current Year
- Farm Tax Rated Parcels - Previous Year

Live Data

Administrative

- Conservation Authority
- Geographic Township
- Lots
- Ontario Public Sector Region

Municipality

- Lower or Single Tier Municipality
- Upper Tier or District Municipality

Crown Land

Primary Land Use Area

- Conservation Reserve
- Enhanced Management Area
- Forest Reserve
- General Use Area
- Protected Area - Far North
- Provincial Park
- Provincial Wildlife Area
- Recommended Conservation Reserve
- Recommended Provincial Park
- Wilderness Area

Environment/Base

- Drain Connection
- ANSI
- NTS 50K Gnd
- Quaternary Watersheds
- Tertiary Watersheds
- Secondary Watersheds
- Soils - Outline

Agricultural Tile Drainage - System Type

- Random
- Systematic

Constructed Drain Type

- Closed/Tiled
- Open or Unknown

Controlled Drainage Class

- Fair
- Good
- Poor

Drain Classification - DFO Class Authorization Type

- A
- B
- C
- D
- E
- F

Soils - CLI

- Class 1
- Class 2
- Class 3
- Class 4
- Class 5
- Class 6
- Class 7
- Organic Soil
- Unclassified
- Water

Soils - Drainage

- Not Applicable
- Imperfectly Drained
- Moderately Well Drained
- Poorly Drained
- Rapidly Drained
- Variable
- Very Poorly Drained
- Very Rapidly Drained
- Well Drained
- Water

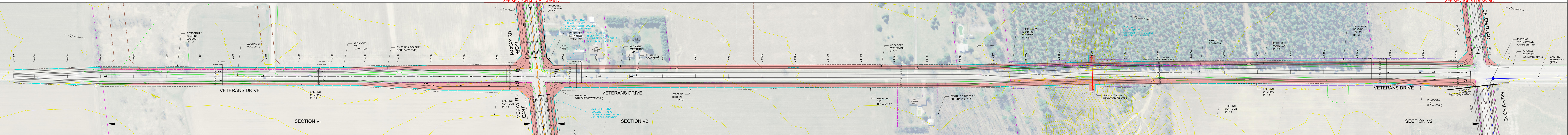
Soils - Hydrologic Soil Group

- A
- B
- C
- D

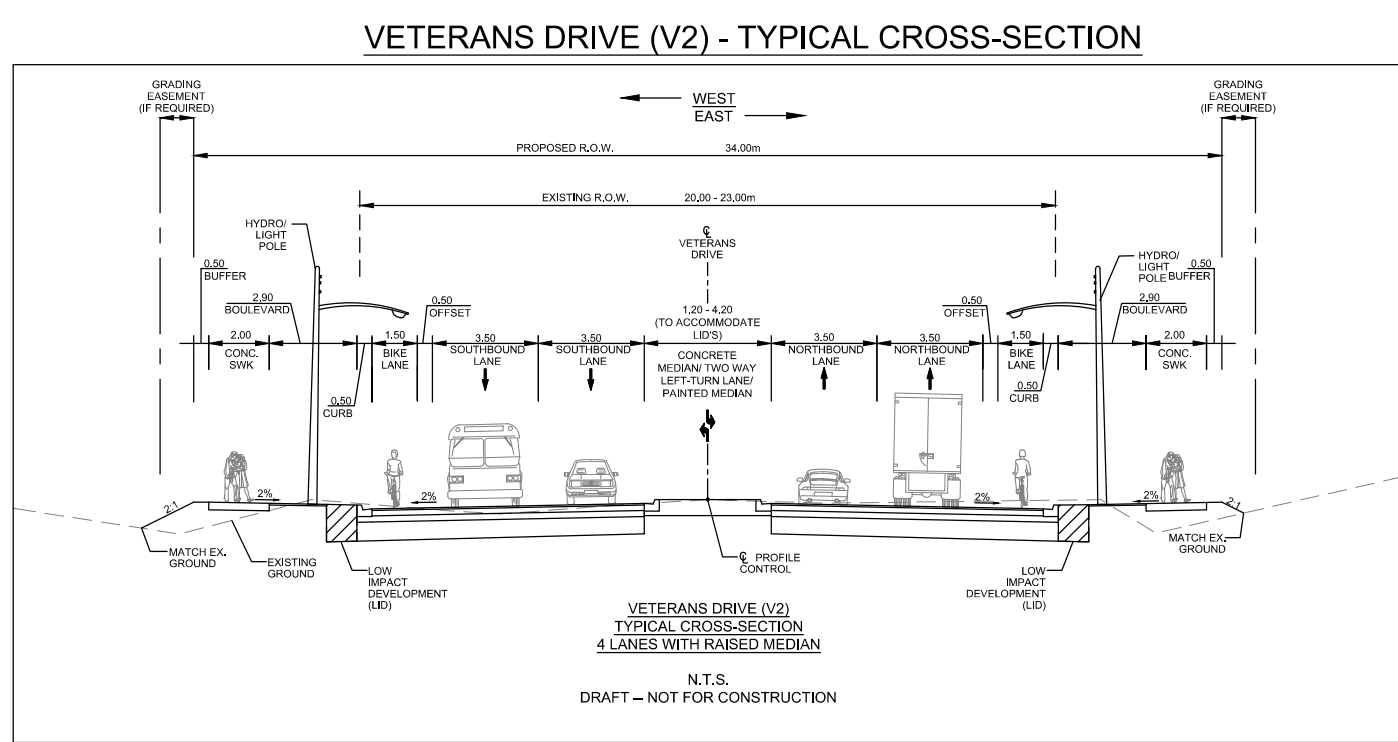
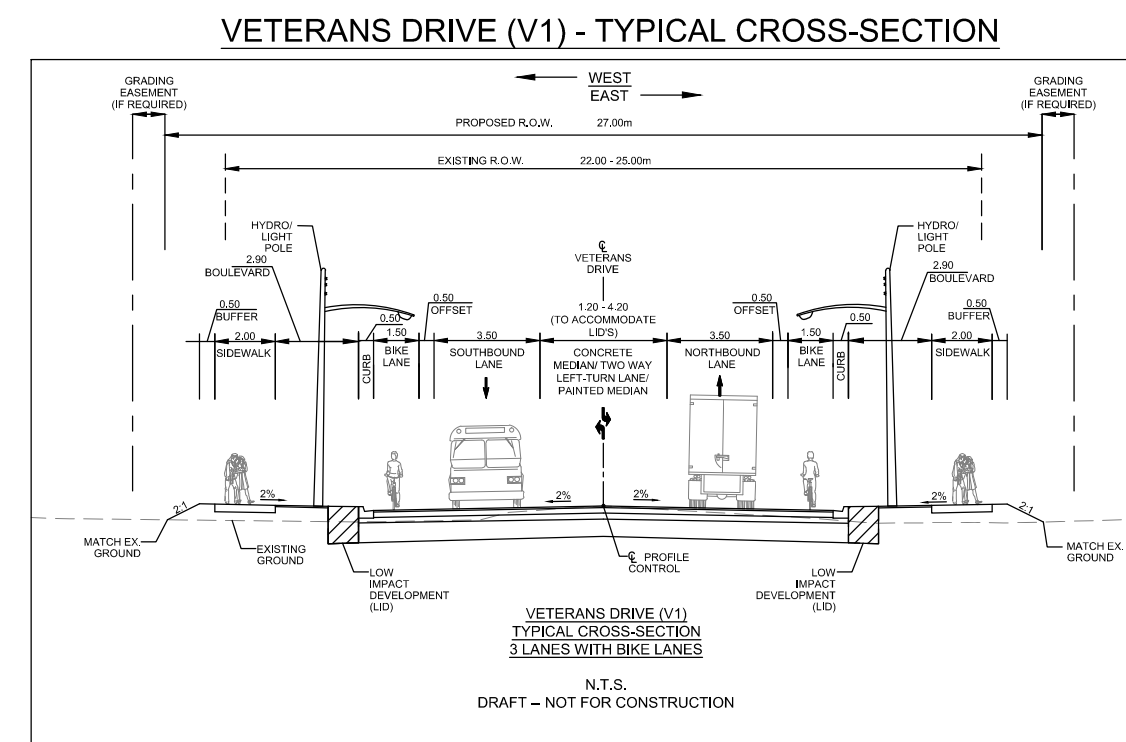


0 0.7 km



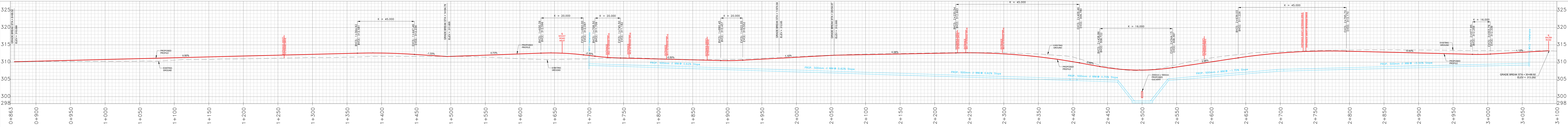


- LEGEND
- PROPOSED SANITARY SEWER
 - PROPOSED WATERMAIN
 - EXISTING WATERMAIN
 - EXISTING CREEK
 - EXISTING PROPERTY BOUNDARY
 - EXISTING DITCHING
 - EXISTING CONTOUR
 - PROPOSED CULVERT
 - PROPOSED 2031 R.O.W.
 - PROPOSED 2051 R.O.W.
 - TEMPORARY GRADING EASEMENT
 - FUTURE ROAD CONNECTIONS
 - PROPERTY ACQUISITION AREA 2031



- LEGEND
- PROPOSED SANITARY SEWER
 - PROPOSED WATERMAIN
 - EXISTING WATERMAIN
 - EXISTING CREEK
 - EXISTING PROPERTY BOUNDARY
 - EXISTING DITCHING
 - EXISTING CONTOUR
 - PROPOSED CULVERT
 - PROPOSED 2031 R.O.W.
 - PROPOSED 2051 R.O.W.
 - TEMPORARY GRADING EASEMENT
 - FUTURE ROAD CONNECTIONS
 - PROPERTY ACQUISITION AREA 2031

- LEGEND
- PROPOSED SANITARY SEWER
 - PROPOSED WATERMAIN
 - EXISTING WATERMAIN
 - EXISTING CREEK
 - EXISTING PROPERTY BOUNDARY
 - EXISTING DITCHING
 - EXISTING CONTOUR
 - PROPOSED CULVERT
 - PROPOSED 2031 R.O.W.
 - PROPOSED 2051 R.O.W.
 - TEMPORARY GRADING EASEMENT
 - FUTURE ROAD CONNECTIONS
 - PROPERTY ACQUISITION AREA 2031



APPENDIX B

Preliminary Engineering Drawings

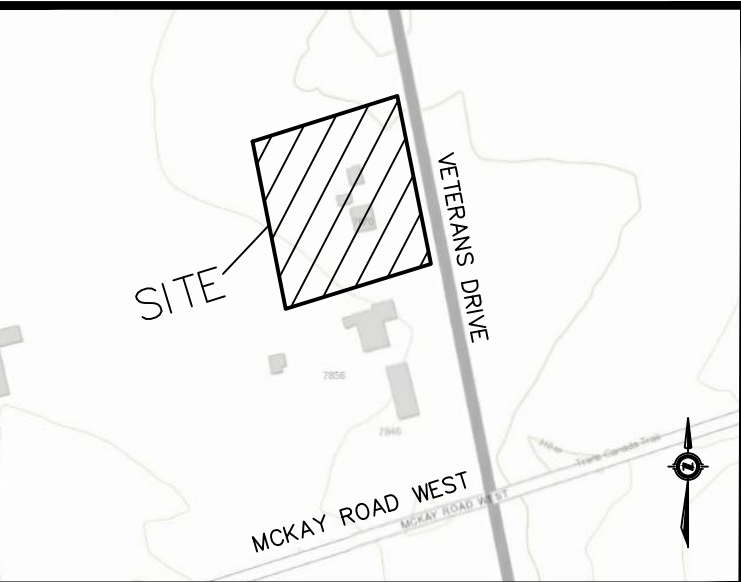
Filename: R:\BARRE ACAD FILES\18-11393B 910 VETERANS DRIVE\01-CIVIL\SHEETS\18-11393B EX-1.DWG
Plot Date: 2019-03-27



The position of existing above ground and underground utilities and facilities are not necessarily shown on the drawings, and where shown, the accuracy of the position of such utilities and facilities is not guaranteed. Before starting work, the contractor shall confirm the exact location of all existing utilities and facilities, and shall assume all liability for damage to them.

Drawings shall not be used for construction unless sealed and signed. All work to be performed in accordance with the Occupational Health & Safety Act 1990.

Any errors and/or omissions shall be reported to Pinestone Engineering Ltd. without delay.



KEY MAP NOTES

1. TOPOGRAPHIC SURVEY PROVIDED BY JOE TOPO LTD.
COMPLETED AUG. 1, 2018

BENCHMARK

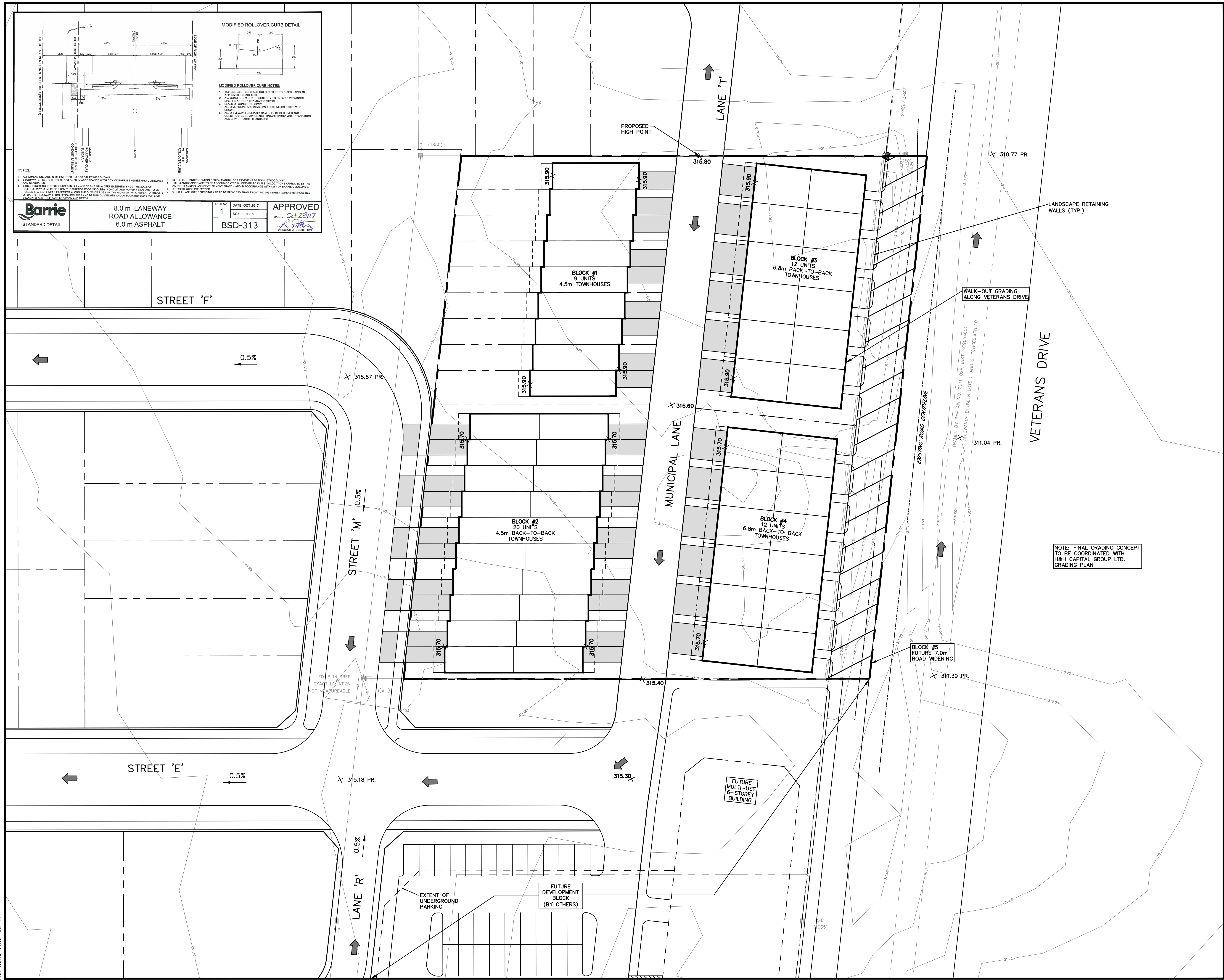
BM#1 TOP OF STANDARD IRON BAR (SIB), NORTH-EAST CORNER OF SITE BOUNDARY, ELEV. 309.96 masl

NO.	YY.MM.DD	REVISION	BY



DESIGN BY:	---
DRAWN BY:	A.L.
CHECKED BY:	J.V.
DATE:	Mar. 27, 2019
SCALE:	1:250

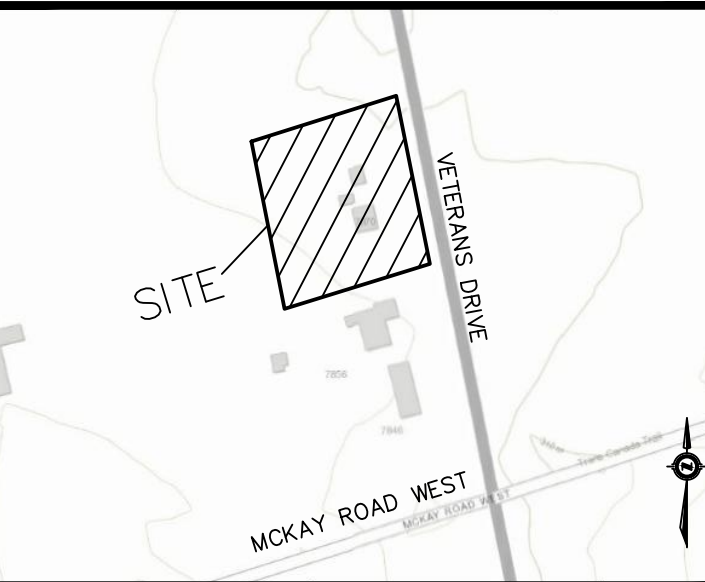
CLIENT/PROJECT		
910 VETERANS DRIVE TOWNHOUSE DEVELOPMENT		
DRAWING TITLE		
EXISTING CONDITIONS PLAN		
PROJECT NO.	DRAWING NO.	REVISION
18-11393-B	EX-1	0



The position of existing above ground and underground utilities and facilities are not necessarily shown on the drawings, and where shown, the accuracy of the position of such utilities and facilities is not guaranteed. Before starting work, the contractor shall confirm the exact location of all existing utilities and facilities, and shall assume all liability for damage to them.

Drawings shall not be used for construction unless sealed and signed. All work to be performed in accordance with the Occupational Health & Safety Act 1990.

Any errors and/or omissions shall be reported to Pinestone Engineering Ltd. without delay.



KEY MAP

NOTES

1. TOPOGRAPHIC SURVEY PROVIDED BY JOE TOPO LTD. COMPLETED AUG. 1, 2018
2. SITE PLAN AND LEGAL INFORMATION PROVIDED BY INNOVATIVE PLANNING SOLUTIONS LTD. MAR. 20, 2019.

LEGEND

- DIRECTION OF MAJOR OVERLAND FLOW
- PROPOSED GRADE POINT ELEVATION
- PROPOSED GRADE POINT ELEVATION FROM H&H CAPITAL GROUP LTD. CONCEPT GRADING PLAN

BENCHMARK

BM#1 TOP OF STANDARD IRON BAR (SIB), NORTH-EAST CORNER OF SITE BOUNDARY, ELEV. 309.96 masl

NO.	YY.MM.DD	REVISION	BY



DESIGN BY:	J.V.
DRAWN BY:	A.L.
CHECKED BY:	J.V.
DATE:	Mar. 27, 2019
SCALE:	1:300

CLIENT/PROJECT

910 VETERANS DRIVE TOWNHOUSE DEVELOPMENT

DRAWING TITLE

CONCEPTUAL GRADING PLAN

PROJECT NO.	DRAWING NO.	REVISION
18-11393-B	GP-1	0